

Obj: Students will apply trigonometric functions to solve right triangles and word problems.

Some inverse trig functions can be found without a calculator: (answer in degrees)

1) $\sin \theta = 1 \rightarrow \theta = \underline{\hspace{2cm}}$

2) $\cos \theta = 0.5 \rightarrow \theta = \underline{\hspace{2cm}}$

3) $\tan \theta = 1 \rightarrow \theta = \underline{\hspace{2cm}}$

4) $\sec \theta = \sqrt{2} \rightarrow \theta = \underline{\hspace{2cm}}$

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What does it mean to solve a right triangle?

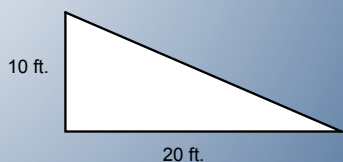
Find the lengths of all 3 sides and find the measures of all 3 angles.

What pieces of information do you need to solve a right triangle?

**An angle (besides the 90 degree one)
and a side ~ OR ~ 2 sides**

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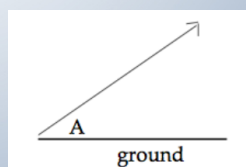
2 Solve the right triangle.



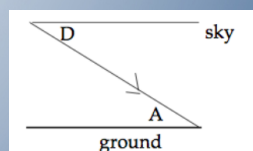
Enter your answer for
the angle opposite 10 ft.
(In degrees)

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As a review...



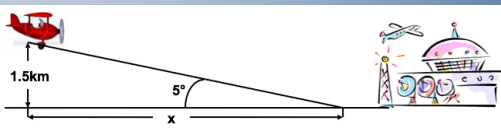
An Angle of Elevation A



An Angle of Depression D
Then $D = A$

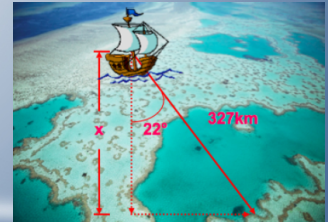
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- 3 A plane is flying at an altitude of 1.5km. The pilot wants to descend into an airport so that the path of the plane makes an angle of 5° with the ground. How far from the airport (horizontal distance) should the descent begin?



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- 4 A ship sailed from a port with a bearing of $S\ 22^\circ E$. How far south has the ship traveled after covering a distance of 327km?



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- 5 A flat 12 foot plank rests with one end on the ground and the other end on a 4 foot ledge.



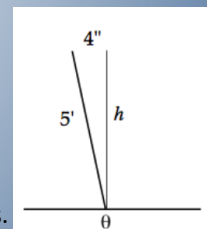
How far from the base of the ledge is the far end of the plank?

What is the grade (i.e., angle of elevation)? (In degrees)

Enter the larger of the two answers.

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- 6 A 5 ft post is supposed to be vertical, but it is 4 inches out of alignment at the top.



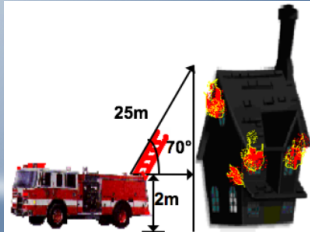
What is the angle of lean?

How high does it reach? (feet)

Enter the larger of the 2 answers.

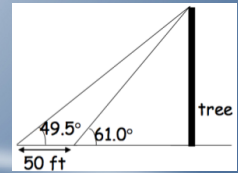
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- 7 A ladder on a fire truck can be turned to a maximum angle of 70° and can be extended to a maximum length of 25m. If the base of the ladder is mounted on the fire truck 2m above the ground, how high above the ground will the ladder reach?



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- 8 You are hiking along a river and see a tall tree on the opposite bank. You measure the angle of elevation of the top of the tree and find it to be 61.0° . You then walk 50 feet directly away from the tree and measure the angle of elevation. If the second measurement is 49.5° , how tall is the tree?



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Your Turn! You work for a text book company, and you have been asked to create a realistic word problem using right triangle trigonometry.

With your group, design a word problem that would be interesting to a high school student. You will be trading with another group, so make sure it would make sense to someone else. Work out the solution separately so you can compare answers when finished.

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Homework:

Create your own *inverse trig* question (word problem) and post it and the solution to it on the wiki.